CLAIMS

1. A method of forming a thin film of vinylidene fluoride homopolymer comprising I-form crystal structure alone or as main component, the method comprises applying, on a substrate, a vinylidene fluoride homopolymer which contains, at one end or both ends thereof, a moiety represented by the formula (1):

$$-(R^1)_n-Y \qquad (1)$$

wherein R^1 is a divalent organic group but does not contain a structural unit of the vinylidene fluoride homopolymer; n is 0 or 1; Y is a functional group, and has a number average degree of polymerization of vinylidene fluoride homopolymer unit of 3 to 100, to form a thin film of the vinylidene fluoride homopolymer comprising I-form crystal structure alone or as main component.

2. The method of forming a thin film of Claim 1, wherein in the vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component, when attention is given to proportions of the respective vinylidene fluoride homopolymers having I-, II- or III-form crystal structure in the thin film of vinylidene fluoride homopolymer which are calculated by IR analysis, the proportion of vinylidene fluoride homopolymers having I-form crystal structure satisfies both of (Equation 1):

$$100 \geq \text{I-form}/(\text{I-form} + \text{II-form}) > 50\ \%\ \text{by weight} \qquad \text{(Equation 1)}$$

and (Equation 2):

$100 \geq$ I-form/(I-form + III-form) > 50 % by weight (Equation 2).

3. The method of forming a thin film of Claim 1 or 2, wherein Y in the formula (1) is a functional group which can impart, to the vinylidene fluoride homopolymer, adhesion to the substrate of organic material and/or inorganic material.

4. The method of forming a thin film of Claim 1 or 2, wherein Y in the formula (1) is a functional group which can make self-organization of vinylidene fluoride homopolymer possible on the surface of the substrate of organic material and/or inorganic material.

5. The method of forming a thin film of Claim 1 or 2, wherein Y in the formula (1) is a functional group which can bond vinylidene fluoride homopolymers each other.

6. The method of forming a thin film of Claim 4, wherein Y in the formula (1) is $-CH=CH_2$, -SH and/or $-SiX_{3-n}R^6{}_n$ (n is 0 or an integer of 1 or 2; R^6 is CH_3 or C_2H_5; X is $-OR^7$, -COOH, $-COOR^7$, $-NH_{3-m}R^7{}_m$, -OCN or halogen atom (R^7 is CH_3, C_2H_5 or C_3H_7, m is 0 or an integer of 1 to 3)).

7. The method of forming a thin film of Claim 5, wherein Y in the formula (1) is $-CH=CH_2$, $-OCOCH=CH_2$, $-OCOCF=CH_2$, $-OCOC(CH_3)=CH_2$ or $-OCOCCl=CH_2$.

8. A laminated article which has, on a substrate, a self-organized thin film formed by using vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component and having a number average degree of polymerization of vinylidene fluoride homopolymer unit of 3 to 100.

9. A laminated article which has, on a substrate, a thin film formed by bonding of vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component and having a number average degree of polymerization of vinylidene fluoride homopolymer unit of 3 to 100.

10. The laminated article of Claim 8 or 9, wherein in the vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component, when attention is given to proportions of the respective vinylidene fluoride homopolymers having I-, II- or III-form crystal structure in the thin film of vinylidene fluoride homopolymer which are calculated by IR analysis, the proportion of vinylidene fluoride homopolymers having I-form crystal structure satisfies both of (Equation 1):

$$100 \geq \text{I-form}/(\text{I-form} + \text{II-form}) > 50\ \%\ \text{by weight} \qquad \text{(Equation 1)}$$

and (Equation 2):

$$100 \geq \text{I-form}/(\text{I-form} + \text{III-form}) > 50\ \%\ \text{by weight} \qquad \text{(Equation 2).}$$

11. The laminated article of Claim 8, wherein the self-organized film formed by using the vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component is formed by using vinylidene fluoride homopolymers having a number average degree of polymerization of vinylidene fluoride homopolymer unit of 3 to 100 and containing, at one end or both ends thereof, a moiety represented by the formula (1-1):

$$-(R^1)_n-Y^1 \qquad (1\text{-}1)$$

wherein R^1 is a divalent organic group but does not contain a structural unit of the vinylidene fluoride homopolymer; n is 0 or 1; Y^1 is -SH and/or $-SiX_{3-n}R^6{}_n$ (n is 0 or an integer of 1 or 2; R^6 is CH_3 or C_2H_5; X is $-OR^7$, -COOH, $-COOR^7$, $-NH_{3-m}R^7{}_m$, -OCN or halogen atom (R^7 is CH_3, C_2H_5 or C_3H_7, m is 0 or an integer of 1 to 3)).

12. The laminated article of Claim 9, wherein the thin film formed by bonding of the vinylidene fluoride homopolymers comprising I-form crystal structure alone or as main component is formed by using vinylidene fluoride homopolymers having a number average degree of polymerization of vinylidene fluoride homopolymer unit of 3 to 100 and containing, at one end or both ends thereof, a moiety represented by the formula (1-2):

$$-(R^1)_n-Y^2 \qquad (1\text{-}2)$$

wherein R^1 is a divalent organic group but does not contain a

structural unit of the vinylidene fluoride homopolymer; n is 0 or 1; Y^2 is $-CH=CH_2$, $-OCOCH=CH_2$, $-OCOCF=CH_2$, $-OCOC(CH_3)=CH_2$ or $-OCOCCl=CH_2$.

13. A ferroelectric device comprising the laminated article of any of Claims 8 to 12.

14. A vinylidene fluoride homopolymer represented by the formula (IA-2):

$$Z^1\text{-}(R^{10})_{n1}\text{-}A^1\text{-}(R^{11})_{n2}\text{-}S\text{-}M^1 \qquad \text{(IA-2)}$$

wherein A^1 is a structural unit of vinylidene fluoride homopolymers having a number average degree of polymerization of 3 to 100; Z^1 is a polyfluoroalkyl group or an alkyl group; R^{10} and R^{11} are the same or different and each is a divalent organic group but does not contain a vinylidene fluoride homopolymer unit comprising I-form crystal structure alone or as main component; n1 and n2 are the same or different and each is 0 or 1; M^1 is hydrogen atom or alkali metal atom.

15. A vinylidene fluoride homopolymer represented by the formula (IB-3):

$$M^2\text{-}S\text{-}(R^{12})_{n3}\text{-}A^2\text{-}R^2\text{-}A^3\text{-}(R^{13})_{n4}\text{-}S\text{-}M^3 \qquad \text{(IB-3)}$$

wherein A^2 and A^3 are the same or different and each is a structural unit of vinylidene fluoride homopolymers and a total number average

degree of polymerization of A^2 and A^3 is from 3 to 100; R^2 is a divalent organic group but does not contain a structural unit of the vinylidene fluoride homopolymer; R^{12} and R^{13} are the same or different and each is a divalent organic group but does not contain a structural unit of the vinylidene fluoride homopolymer; n3 and n4 are the same or different and each is 0 or 1; M^2 and M^3 are the same or different and each is hydrogen atom or alkali metal atom.